DoD Joint Spectrum Center

JSC MISSION

To ensure the Department of Defense's (DOD's) effective use of the electromagnetic spectrum in support of national security and military objectives.

The DoD Joint Spectrum Center (JSC) serves as the DOD center of excellence for electromagnetic spectrum management matters in support of the Director for Command, Control, Communication and Computer Systems, Joint Staff (J6), the Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (OASD(C3I)), the Unified Commands, Military Departments, and defense agencies. The JSC supports the Electronic Protect missions of Information Warfare (IW) as they relate to spectrum supremacy.

Joint Spectrum Center -- MCEB Memo, Subj: Concept of Operations

JSC Areas of Expertise

- **Spectrum Planning Guidance**
  - active role to assess frequency supportability, both nationally and internationally, for proposed technologies.
- **System Performance/Measurement Tests**
  - apply a wide range of analytical tools or testing to determine the ability of a system to meet performance specifications to promote EMC with other environmental communication-electronic equipment.
- **System Integration**
  - using specialized equipment parameter databases, sophisticated coupling models, and interference analysis tools, predict when/if cosite interference will occur -- develop mitigation techniques.
- **Environmental Analysis**
  - predict when, where, and how interference might occur for terrestrial, air and space-borne systems using sophisticated models that incorporate worldwide frequency assignment and equipment parameter databases.

Spectrum Management

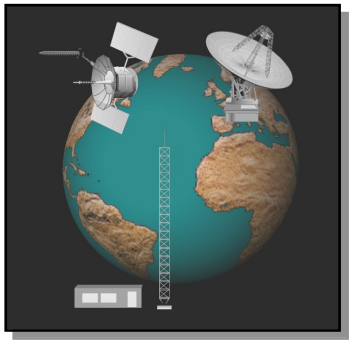
Planning - Coordinating - Managing

- **the Use of the Electromagnetic Spectrum to:**
  - **Achieve Electromagnetic Compatibility (EMC)**
  - **Prevent Electromagnetic Interference (EMI)**
  - **Assure Jam-Resistant, Interference-free, Exploitation-free, Guaranteed Access to the Frequency Spectrum**

Comprehensive and coordinated strategy critical to assured spectrum access

DoD EMC Databases

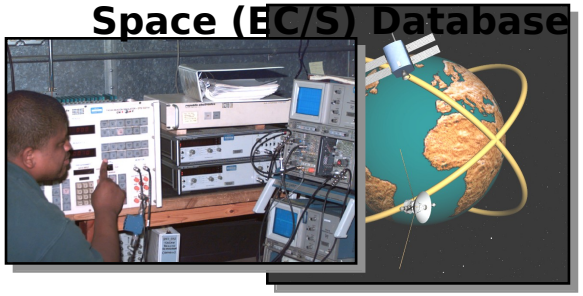
Background Environment Information (BEI)



Authorization to Use Spectrum

- **4,950,000 Non-DOD Frequency Assignments**
  - **Government Master File**
  - **Federal Communications Commission**
  - **International Frequency List**
  - **Canadian Date File**
  - **Master Radio Frequency List**

Equipment Characteristics/ Space (EC/S) Database



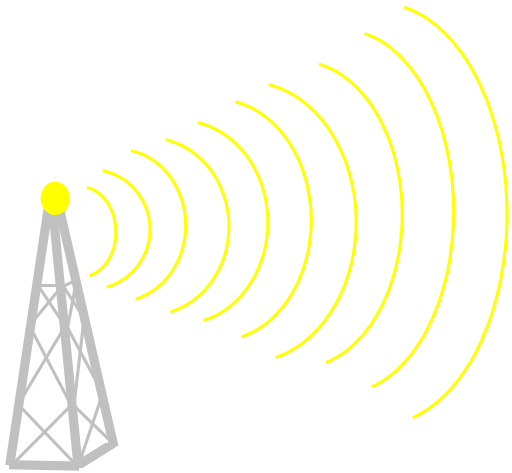
Detailed Parametric and Orbital Data

- **21,800 Communication Systems**
- **7,800 Radars**
- **2,800 Satellites**

Tactical Database (TACDB)

Platform Fits
Equipment Inventories
Scenario/Deployments

Siting Mobile Service Providers (MSPs) on DoD Property



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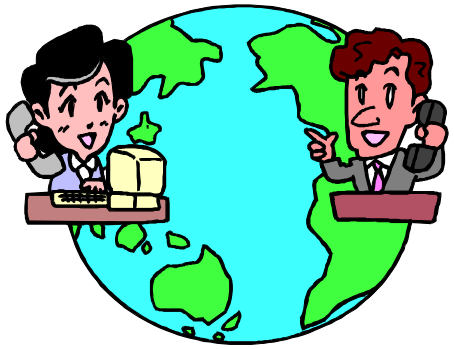
OUTLINE

- MSP BACKGROUND & GUIDELINES
- PRE-JSC COORDINATION
- JSC COORDINATION
- SITE VISIT OBJECTIVES
- JSC ANALYSIS
- MISCELLANEOUS & SUMMARY



MSP BACKGROUND

- **Provisions of the Telecommunications Act of 1996 (Sec. 704):**

  Directed the heads of all government departments and agencies to facilitate access by MSPs to Federal Property for the purpose of siting equipment and Mobile Service Antenna (MSAs).

- **The General Services Administration (GSA) Guidelines for Compliance (FPMR D-242)**

  Provided all Federal agencies with general guidelines for implementation of the Telecomm Act of 1996

DoD GUIDELINES

- DoD, ASD(C3I) Memo, dated 15 December 1997:
  - ***Directed Commanders to coordinate requests with JSC***
  - ***JSC to evaluate sitings for potential EMI to gov't operations***
  - ***Requester required to fund JSC analysis***

- DoD Directive for E3 Programs (DoD 3222.2)
  - ***DoD Service Entities may perform E3 analysis for MSPs***

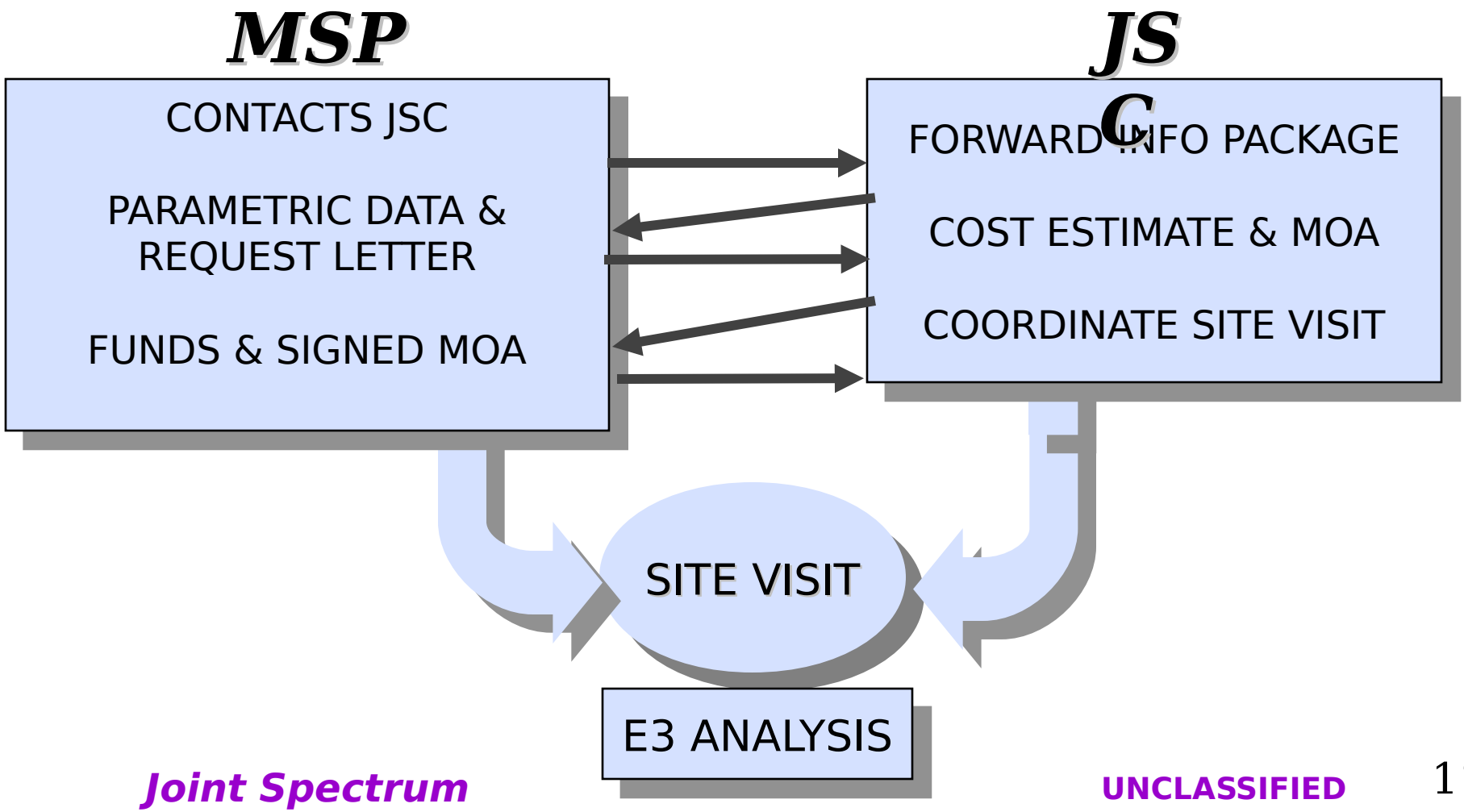
PRE-JSC COORDINATION

- FCC, Real Property, Frequency Manager, and other key agencies

  - *Tentative Site Location(s), Eqpt Layout, Tower Height, etc.*

  - *Draft Lease Agreement, **E3 Analysis**, Environmental Study, Security, Safety, etc.*

JSC COORDINATION



SITE VISIT OBJECTIVES

Frequency Manager

Review Frequency Records
Planned Comm Systems

MSP RF Engineer

Review Frequency Data

Real Property

Site Map
Verify Grid Coordinates
Fuels/Ordnance

Base Safety Personnel

RADHAZ Calculation

JSC ANALYSIS

- **Linear EMI Effects**
- **Non-linear EMI Effects**
- **EM Radiation Hazards (RADHAZ)**

JSC ANALYSIS

- **Linear EMI Effects**
  - ***In-Band and Adjacent Band Interactions***
    - *Gov't/FCC Assignments Within 125Km/17Km*
  - ***Harmonics***
    - *2nd/3rd (Gov't/FCC Assignments Within 50Km/17Km)*
- **Analysis Model gathers data from Freq Assignment Records, Performs I/N-based Power Calculations**
- **Manual Calculations**

JSC ANALYSIS

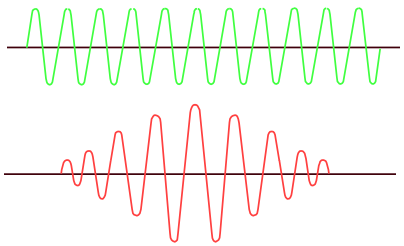
- **Non-Linear EMI Effects**
  - ***Analysis of Intermods***
    - ***All Freq Assignments Within 4 Km***
    - ***2-Signal, 2nd and 3rd Order; 3-Signal, 5th Order Interactions***
- **Analysis Model gathers data from Freq Assignment Records, Performs Frequency Mix and I/N-based Transmitter and Receiver Power Calculations**
- **Manual Calculations**

JSC ANALYSIS

- **RADHAZ**
  - ***Personnel, Fuels, and Ordnance w/EIDs***
  - ***Total System EIRP and PD Threshold to Calculate Required Separation Distances***
    - ***Most Stringent Reqts by Services (Army, Air Force, Navy) Used***

TYPICAL FREQUENCY BANDS

- **SMR**
  - ***851-866 MHz , 806-821 MHz***
- **CTS**
  - ***869-894 MHz, 824-849 MHz***
- **PCS**
  - ***1930-1990 MHz, 1850-1910 MHz***
- **Trunking Systems**
  - ***160-174 MHz, 406-420 MHz, 453-466 MHz, 808-890 MHz***
- **Microwave Systems**
  - ***2-23 GHz***

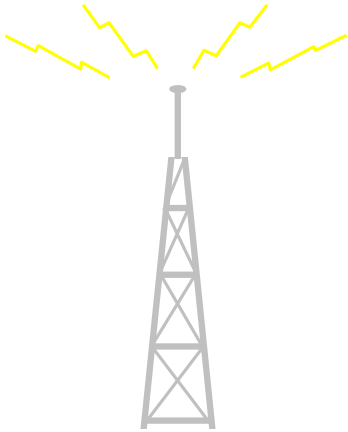


JSC ANALYSIS RESULTS

- **Preliminary Results via E-mail in 6 Wks**
- **Formal CR in 10 Weeks**
- **Results Provided to Base Personnel for Consideration in Approval/Disapproval Process**
  - ***Identifies Potential Problems and Provides Recommendations***

MISCELLANEOUS

- ***Two-Way Analysis May be Requested***
- ***Unused Funds Returned, Will be Firm Fixed Price***



SUMMARY

- **In compliance w/Telecomm Act of 1996, Federal property is available for commercial wireless use**
- **Coordination is required between the MSP Vendor, Base/DoD Agency, and JSC**
- **JSC has the software models for prompt E3 analysis and results**
- **Website: www.jsc.mil**